APPLYING TERM CONSISTENCY TO AN INEQUALITY CONSTRAINED INTERVAL GLOBAL OPTIMIZATION PROBLEM

ABSTRACT

One embodiment of the present invention provides a system that solves a global optimization problem specified by a function f and a set of inequality constraints $p_i(\mathbf{x}) \leq 0$ $(i=1,...,m)$, wherein f and p_i are scalar functions of a vector $\mathbf{x} = (x_1, x_2, x_3, \ldots x_n)$. The system operates by receiving a representation of the function f and the set of inequality constraints, and then storing the representation in a memory within the computer system. Next, the system performs an interval inequality constrained global optimization process to compute guaranteed bounds on the minimum value of the function $f(\mathbf{x})$ subject to the set of inequality constraints. While performing the interval global optimization process, the system applies term consistency at various places in the process over a subbox $\mathbf{X}$, and excludes any portion of the subbox $\mathbf{X}$ that violates term consistency.